



Do variations in Mozambique Channel hydrography impact the marine climatology of the Agulhas gateway between the Indian Ocean and Atlantic?

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Sea surface temperature (SST) and sea surface salinity (SSS, via seawater $\delta^{18}\text{O}$) reconstructions from a core located at the northern entrance of the Mozambique Channel (Davie Ridge) are presented. High resolution paired planktonic $\delta^{18}\text{O}$ and Mg/Ca measurements of the surface-dwelling foraminifer *Globigerinoides ruber* white (sensu stricto) are employed to investigate the long term hydrographic variation in a region that supplies the source waters of the Agulhas Current. The abundance of the species at this tropical location remains high across glacial and interglacial sections of the sediment core, hence enabling continuous records of past temperature and salinity. Glacial-interglacial $\delta^{18}\text{O}$ amplitudes are 1-1.6 ‰ while the Mg/Ca derived SST reconstructions indicate a mean glacial-interglacial temperature difference of 2-2.5° C depending on the palaeotemperature equation used; highest SST are derived for MIS 5e. Glacial-interglacial SST amplitudes at our core site fit well with those further downstream (Caley et al., 2011) and in the Atlantic sector of the Agulhas gateway connecting the Indian Ocean with the Atlantic (Martínez-Méndez et al., 2010). This suggests a direct influence of the Mozambique Channel hydrography on the long term Agulhas variability but the offset structure of the SST developments in the Agulhas Corridor indicate the gateway circulation dynamics as an additional control for SST variability there. We explore the connection between Agulhas Current variability of the last three climatic cycles, Mozambique Channel hydrographic variability and tropical climates of the wider Indian Ocean region.

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References:

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